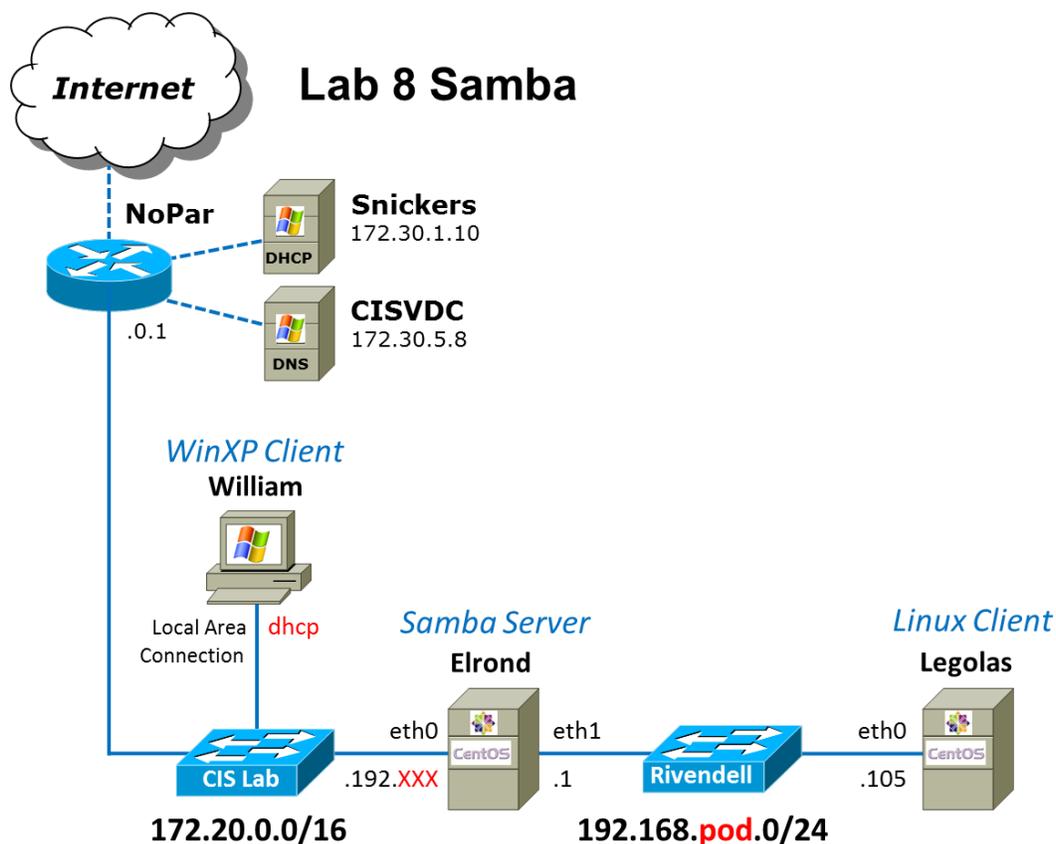




### Lab 8: Samba

The purpose of this lab is to share files among Windows and Linux hosts on a common network. The goal is to browse directories on the Linux servers from a Windows machine. This will be accomplished using William and Legolas as clients, and Elrond as the Samba Server.



.XXX is based on your pod number

## Supplies

- VMWare ESXi and vSphere Client
- 192 VMs: William (Win XP), Elrond (CentOS), and Legolas (CentOS)
- Virtual networks: Rivendell

## Forum

Use the forum to ask and answer questions, collaborate, and report any equipment issues. Post tips and any lessons learned when you have finished. Forum is at:  
<http://oslab.cabrillo.edu/forum/>

## Background

Samba is an implementation of Windows file and print services for Linux allowing the sharing of files and printers between Windows and Linux. Samba's name is based on the protocol used by the Microsoft Windows network file system, SMB (Server Message Block).

On the Linux Samba server, the firewall will need to be configured so other systems can access the shared directories. Samba uses ports 137, 138, 139 and 445 so these ports will need to be opened.

There are several places where permissions will be to be configured. The normal UNIX file permissions need to be set (with `chmod`). Additional access controls can be defined in the Samba configuration file for each share. And with SELinux set to enforcing mode, the shared files must be labeled with extended attributes to comply with the SELinux policy.

The commands we will be using for this lab are:

- `mount`, `umount`
- `smbclient`
- `smb`
- `testparm`
- `setsebool`
- `chcon`

The configuration of the `smb.conf` files will require root access; the browsing of directories may be performed by a regular user.

## Pre-configuration

- Read carefully the whole lab and make a custom network map and crib sheet of commands to use.
- Make a copy of the `lab08` text file in `/home/cis192/depot` in your home directory on Opus.
- [optional] Revert VMs back to their Pristine snapshots. Starting fresh will allow you to practice the basic network setup configuration.

## Part 1 - Cable and configure Linux VMs

- Cable Elrond, Legolas as shown in the map above.

- ❑ Permanently configure on all VMs:
  - Static IP addresses on all interfaces
  - Default gateways
  - Name servers
- ❑ Start with default CentOS firewalls on Elrond and Legolas. If you don't have the default firewall there is a backup in `/home/cis192/depot` on Opus.
- ❑ Permanently configure Elrond to be a gateway router.
  - Enable packet forwarding
  - Configure the default firewall to enable packet forwarding.
  - Configure NAT (use MASQUERADE) so Rivendell hosts have Internet access.
- ❑ Disable services from previous labs if present.
- ❑ Populate `/etc/hosts` as necessary for this lab.
- ❑ Verify connectivity.

## Part 2 - Configure William

- ❑ Cable and configure William to use DHCP .
- ❑ Verify your computer name for William is `pNN-william`, where `NN` is your pod number.
- ❑ Determine IP address assigned to William using:
  - **ipconfig /all**
- ❑ Populate to `C:\WINDOWS\system32\drivers\etc\hosts` on William with at least Elrond.
- ❑ Verify connectivity.
- ❑ Examine the contents and permissions of the folders, `depot` and `depot192`, off the `C:\` drive.
- ❑ To view permissions, right click on a folder, select Properties, Sharing tab, Permissions button.
  - Verify the permissions on the `depot` share are Everyone: Read.
  - Verify the permissions on the `depot192` share are cis191: none and cis192: Full Control, Change, Read.
- ❑ To monitor access to shares right click on My Computer icon (labeled William) and select Manage to run the MMC (MS Management Console). In the MMC left panel, expand (click on the +) Shared Folders. Then click on Shares, Sessions or Open Files to view share status.
- ❑ Keep the MMC window open and monitor it as you connect to shares from Elrond

## Part 3 - Access shares on William from Elrond

Samba client software on Elrond will be used to access file shares on William, the Windows XP system. The `smbclient` command will be used to list shares and retrieve files. The `mount` command will be used to mount a remote Windows file share on the local Linux file tree.

On Elrond:

- ❑ Use **yum install samba samba-client cifs-utils** to install Samba. The `cifs-utils` package allows mounting remote Samba shares with the `mount` command.
- ❑ List the public shares on William with **smbclient -L pNN-william** (just hit Enter when prompted for a password)
- ❑ Browse the network neighborhood using **smbtree**
- ❑ Mount the depot share as cis192:

**mount //pNN-william/depot /mnt -o username=cis192**

- Verify you can read but not create files in */mnt*
  - On William, use the MMC to view share status. It may be necessary to click the little refresh icon under View to get current information.
  - Use **umount /mnt** to close the session.
- Try to mount the depot192 share as user cis191 using  
**mount //pNN-william /depot192 /mnt -o username=cis191**
- This should fail given the user cis191 has no access permissions
- Now mount the depot192 share as user cis192 using:  
**mount //pNN-william /depot192 /mnt -o username=cis192**
- Verify you can read the files in the share
  - Verify you can add new files to the share
  - Use **umount /mnt** to close the session
- The smbclient command can also be used in an ftp-like manner to transfer files. Use the following to start a session and copy some files:  
**smbclient -U cis192 //pNN-william /depot192**  
Type the following commands at the smb: \> prompt:
- ```
help
ls
dir
mget *.txt
quit
```

#### Part 4 - Create a Samba server on Elrond

Configure Elrond as a Samba server. The configuration will include making shares, poking holes in the firewall and allowing files to be accessed under the default SELinux policy. The shares will be accessed from the Windows PC (William).

- Make two directories to be shared:  
**echo "We can do anything we want if we stick to it long enough." - Helen Keller > /tmp/hk.txt**  
**cd /var**  
**mkdir -p shares/depot shares/depot192**  
**cd shares**  
**cp /tmp/hk.txt depot/**  
**cp /tmp/hk.txt depot192/**  
**chmod 755 \***  
**chown -R cis192:users \***
- Add a cis191 user:  
**useradd -c "CIS 191" -g users cis191**
- Set the password with **passwd cis191**
- Add passwords to the Samba password database  
**smbpasswd -a cis191**  
**smbpasswd -a cis192**
- Edit */etc/samba/smb.conf* file using your favorite editor.
- In the Globals section, make the following changes:  
**workgroup = WORKGROUP**  
**server string = Cool Samba Server**
  - Add to the bottom of the *smb.conf* file the following shares:  
**[depot]**  
**comment = Public files on Elrond**

```
path = /var/shares/depot
read only = yes
guest ok = yes
```

```
[depot192]
comment = CIS 192 files on Elrond
path = /var/shares/depot192
valid users = cis192
writeable = yes
```

- ❑ Run the **testparm** command to verify and test the syntax of the *smb.conf* file. Ensure that no errors are displayed with reference to the file. (Ignore any error messages regarding long share names.) Press Enter to display the dump of the shares, when prompted by the testparm command.
- ❑ On Elrond, permanently open up the firewall for file sharing (ports 137/udp, 138/udp, 139/tcp, and 445/tcp):

```
iptables -I INPUT 4 -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
iptables -I INPUT 4 -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
iptables -I INPUT 4 -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
iptables -I INPUT 4 -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
service iptables save
```
- ❑ On Elrond, show then change the SELinux context for the directories shared from var\_t to samba\_share\_t:

```
cd /var/shares
ls -lRZ
chcon -R -t samba_share_t *
ls -lRZ
```
- ❑ On Elrond, show then change the SELinux boolean to enable sharing home directories:

```
getsebool samba_enable_home_dirs
setsebool -P samba_enable_home_dirs=1
```
- ❑ We need to address [https://bugzilla.redhat.com/show\\_bug.cgi?id=913762](https://bugzilla.redhat.com/show_bug.cgi?id=913762) by installing updated SELinux policies:

```
yum update selinux-policy selinux-policy-targeted
```
- ❑ You must now start the smb and nmb services:

```
service smb start
service nmb start
chkconfig smb on
chkconfig nmb on
```
- ❑ On William, log in as cis192, and test the shares by:
  - Start > My Network Places
  - Click "View workgroup computers" on left panel
  - Look for and open the Cool Samba Server (Elrond) icon.
  - It should succeed and display the shares on Elrond.
  - The cis192 user should be able to open the cis192, depot and depot192 shares, but not the cis192 share.
  - Congratulations ... you have just made your first Samba server!
- ❑ On William, log in as cis191, and test the shares by:
  - Start > My Network Places
  - Click "View workgroup computers" on left panel
  - Look for and open the Cool Samba Server (Elrond) icon.
  - It should succeed and display the shares on Elrond.
  - The cis191 user should be able to open the cis191 and depot shares, but not the cis192 or depot192 shares.

- If you need to close connections on William use:  
**net use \* /delete**
- Close the windows you opened on William to access the Samba server and lets look at quicker way to access the same share:
  - Start > Run
  - Type \\elrond\depot
  - Click **OK** button

## Part 5 - Access Samba server on Elrond from Legolas

Access the Samba shares on Elrond from another Linux system (Legolas)

- Use **yum install samba-client cifs-utils** to install the Samba client. The cifs-utils package allows mounting remote Samba shares with the mount command.
- On Legolas, use  **smbclient -L elrond** to see shares on Elrond (don't enter a password, just hit Enter)
- Now try  **smbclient -L elrond -U cis192%** (should not get prompted for a password now)
- Now mount the **depot192** share as **user cis192** using:
  - **mount -o username=cis192 //elrond/depot192 /mnt**
  - Enter the correct password
  - Verify you can read the files in the share
  - Use **umount /mnt** to close the session
- The smbclient command can also be used in an ftp-like manner to transfer files. Use the following to start a session and copy some files:
  - smbclient -U cis192 //elrond/depot192**
  - Type the following commands at the smb: \> prompt:
    - help
    - ls
    - dir
    - mget \*.txt
    - quit

## To turn in

Record the following in your *lab08* text file:

1. Elrond's smb.conf file (with comments removed)  
**sed -e '/^#/d' -e '/^;/d' /etc/samba/smb.conf**
2. Elrond's **smbclient -L pNN-william** output
3. Elrond's firewall and NAT settings:  
**cat /etc/sysconfig/iptables**
4. Elrond's SELinux settings on the shares:  
**ls -lRZ /var/shares**
5. Elrond's SELinux Booleans:  
**getsebool -a | grep samba**
6. Legolas: **smbclient -U CIS192 //elrond/depot192** and **ls** subcommand output

Check your work for completeness then submit as many times as you wish up until the due date deadline. Remember, late work is not accepted, so start early, plan ahead for things to go wrong and use the forum to ask questions.

**cp lab08 ~rsimms/turnin/cis192/lab08.\$LOGNAME**  
and email your map/crib sheets to **rsimms@cabrillo.edu**

**Grading rubric (30 points)**

- 5 points for network map/crib sheet
- 5 points for Elrond's correctly configured smb.conf file
- 5 points for Elrond's smbclient -L pNN-william output
- 5 points for Elrond's correct firewall and NAT settings
- 5 points for Elrond's correct SELinux settings
- 5 points for Legolas' directory listing of Elrond's depot192 share